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Abstract: This study takes place in the MedUP project, founded by the "Agence Nationale de la Recherche" (French Research Agency) through its VMC program ("Vulnérabilité, Milieux, Climats "). MedUP deals with the quantification and identification of sources of uncertainties associated with the forecast and climate projection for Mediterranean high-impact weather events. Here, we focus on the estimation of return periods and return levels of extreme rainfalls in the Cévennes-Vivarais region. The hourly data were collected from 142 raingauges located in this region between 1993 and 2000. A first analysis revealed that, the excess rainfall distribution depends on the raingauges location. We propose to model the excess rainfall distribution by a Generalized Pareto Distribution with positive shape parameter depending on geographical covariates. This so-called "conditional tail-index" is then estimated with a nearest neighbour approach. This permits to derive return period maps on the region of interest.